INL's Battery Test Center provides 17,500 square feet of space equipped with tools that allow testing of several hundred batteries at the same time

INL's Battery Test Center

Improving Energy Storage and Advanced Vehicles

The Battery Test Center at Idaho National Laboratory (INL) is the Department of Energy, Office of Energy Efficiency and Renewable Energy's (EERE) primary center for battery technology testing. The test facility provides 17,500 square feet of laboratory space equipped with tools that allow testing of several hundred batteries at the same time, ranging from small cells to full-sized battery packs used in current light-duty vehicles.

Testing Capabilities

Testing equipment includes more than 650 test channels for advanced energy storage testing at the cell-level, module-level and pack-level. Test stations are capable of outputs up to 1000Vdc with output currents as high as 500 amps and 350kW. Stations can also be operated in parallel to produce outputs up to 1000Vdc at 1000 amps with 700kW in both charge and discharge direction. The testers can be programmed to perform any test profile while simultaneously monitoring constraints such as voltage and temperature limits. Batteries are typically tested inside thermal chambers, including 2 walk-in chambers for full-size pack-level testing, to ensure consistent and repeatable temperature conditions. The thermal chambers are

Continued next page

The Battery Test Center can test batteries ranging from small cells to full-sized battery packs used in current light-duty vehicles.

The Energy of Innovation

Idaho National Laboratory

Continued from previous page

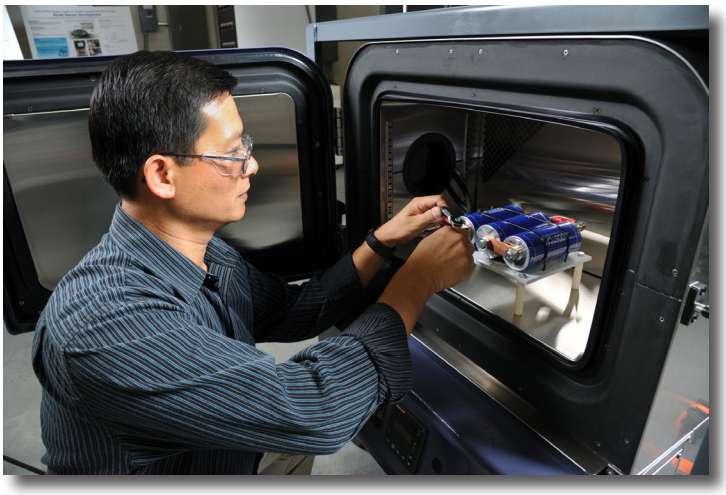
capable of a wide range of temperatures, from -65 to 190 °C for enhanced testing and modeling capability. Data acquisition capabilities include thermocouple channels and reconfigurable analog inputs as well as CAN bus capabilities to allow for communications with integrated battery management systems and diagnostics.

Vibration Test Station

Because of their high-energy content, high-power capability, and significant cost, the electrical safety and mechanical robustness of batteries in hybrid, plug-in hybrid, and electric vehicle applications is critical. INL has a vibration test station to test mechanical durability based on accepted standardized test protocols. The Ling Dynamic Systems Vibration System, with a 25 inch diameter armature, can accommodate all of the short duration random vibration tests for all vertical, longitudinal, and lateral spectrum testing as outlined in nationally established battery test procedures. This system is capable of testing larger format items using the 36 ft^2 head expander and 48 ft^2 slip table. In addition to batteries, ultracapacitors and other electronics can also be tested to standards for their applications.

Research Excellence

INL researchers have, through both laboratory and field experience, developed the protocols for testing energy storage devices. The impacts and improvements of reliable, repeatable testing have applications not just for transportation applications, but also for Department of Defense, consumer electronics, and grid storage applications. Data collected, analyzed, and reported from the laboratory is recognized as some of the most reliable and accurate data available. INL battery research is the most comprehensive in the nation, combining real-world applications and laboratory test data into reliable information for researchers, designers, industry, elected officials' and taxpayers.



Batteries are typically tested inside thermal chambers, including 2 walk-in chambers for full-size pack-level testing.

In addition to testing battery performance, INL has a vibration test station to test mechanical durability based on accepted standardized test protocols.

Working with INL's Battery Test Center

To learn more about partnering mechanisms to work with INL through Cooperative Research and Development Agreements, licenses, or Work for Others agreements, please visit the INL website, inl.gov, and the Technology Transfer, Partnering Mechanisms tabs, or go directly to: http://go.usa.gov/K4xj

For more information

Technical Contact

Eric Dufek
Group Lead, Energy Storage
(208) 526-2132
eric.dufek@inl.gov

Communications Contact

Nicole Stricker
Energy & Environment
(208) 526-5955
nicole.stricker@inl.gov

A U.S. Department of Energy National Laboratory